

Appln. No. 10/632,632
Amdt. dated: November 10, 2004
Reply to Office Action dated September 9, 2004

Remarks/Arguments

These remarks are in response to the Office Action dated September 9, 2004. This reply is timely filed. At the time of the Office Action, claims 1-18 were pending in the application. Claims 11-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,604,592 to Pinson (hereinafter "Pinson") in view of U.S. Patent No. 6,743,371 to John et al. Claim 1 has been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9 and 12-13 of copending Application No. 10/648,913. Claim 10 has been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9 and 12-13 of copending Application No. 10/648,913 in view of Pinson. Claims 1-18 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10/614,149. The rejections are set out in more detail below.

I. Brief Review of Applicants' Invention

Prior to addressing the Examiner's rejections based on art, a brief review of applicants' invention is appropriate. The invention relates a variable waveguide system that includes a waveguide, a dielectric structure that at least partially defines at least one cavity disposed within the waveguide, and a conductive fluid. The cavity is filled with the conductive fluid in a first operational state, and the cavity is purged of the conductive fluid in a second operational state. A fluid control system can be provided

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for transferring the conductive fluid in and out of the cavity in response to a control signal.

Applicants' invention also includes a method of controlling a waveguide. The method is comprised of several steps which can include (1) providing a waveguide dimensioned for producing a first electrical characteristic for the waveguide (2) adding a conductive fluid to an internal portion of the waveguide to produce a second electrical characteristic for the waveguide in response to a control signal. The second electrical characteristic is different from the first electrical characteristic. For example, the first electrical characteristic can be a first waveguide cutoff frequency and the second electrical characteristic can be a second waveguide cutoff frequency.

Applicants' claims 1 and 11 have now been amended to more clearly recite that which Applicants regard as the invention.

II. Claim Rejections on Art

Claims 11-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,604,592 to Pinson in view of U.S. Patent No. 6,743,371 to John et al. Applicants respectfully traverse the Examiner's rejection.

In Pinson, a fixed volume of ferromagnetic fluid 64 is disposed within a waveguide channel cavity 54. A pair of permanent magnets 56, 58 holds the ferromagnetic fluid in place inside the cavity within a channel 66. Energizing a set of electromagnets 60, 62 repositions the ferromagnetic fluid within the cavity, causing a full or partial obstruction of the waveguide 52. Pinson, Col. 3, lines 28-58.

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In contrast to Pinson, Applicants' amended claim 11 recites that an internal waveguide cavity is at least partially formed from a dielectric structure provided within the waveguide. For example, Applicants' specification discloses that each cavity can be formed within a conduit as described in paragraph 20 of the specification. Alternatively, one or more dielectric walls can completely or partially define the cavity as described in paragraphs 28 and 29 of Applicants' specification. By constraining the conductive fluid within dielectric structures within the waveguide, Applicants' invention does away with the need for Pinson's magnetic control system. Instead, the conductive fluid in Applicants' invention is constrained by the dielectric walls of the cavity, and a control system directs the necessary volume of conductive fluid to the internal cavities as needed. Pinson does not disclose an internal cavity of the waveguide at least partially formed of a dielectric material.

Further, Applicants note that amended claim 11 recites a first operational condition in which an internal waveguide cavity is "purged of a conductive fluid" and a second operational condition in which the internal waveguide cavity is filled with a conductive fluid. Applicants note that Pinson fails to disclose the combination of these conditions. Regardless of how one might wish to characterize the waveguide and channels in Pinson, there is no defined cavity in that reference that is "filled" in one state and "purged" in a second state. At best, the fluid in Pinson only partially fills the waveguide when Pinson's electromagnets are energized.

Finally, Applicants note that John et al. does not make up for the deficiencies of Pinson. Instead, that reference merely discloses that ferromagnetic fluids can be conductive. Nowhere in John et al. is it disclosed or suggested that the operating

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characteristics of a waveguide can be controlled by selectively varying a volume of conductive fluid contained within a cavity defined within a waveguide. Moreover, John et al. does not disclose or suggest the use of dielectric cavities within waveguides for constraining a conductive fluid as recited in Applicants' claim 11. In view of the foregoing, Applicants respectfully submit that claims 11-13, as amended, are not rendered obvious by the combination of Pinson and John et al.

III. Double patenting rejection

Claim 1 has been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9 and 12-13 of copending Application No. 10/648,913. Claim 10 has been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9 and 12-13 of copending Application No. 10/648,913 in view of Pinson.

Claims 1-18 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10/614,149.

In response to these double patenting rejections, applicants are submitting herewith two (2) terminal disclaimers. Accordingly, the double patenting rejection is believed to have been overcome. Please charge Deposit Acct. No. 50-2884 in the amount of \$220, pursuant to 37 CFR 1.20(d).

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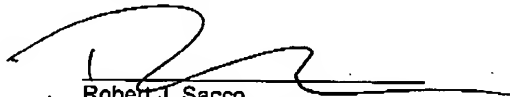
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IV. Conclusion

Applicants have made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. Nevertheless, Applicants invite the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. In view of the foregoing remarks, Applicants respectfully requests reconsideration and prompt allowance of the pending claims. Please charge any deficiencies or credit any overpayments to Deposit Acct. No. 50-2884.

Respectfully submitted,

11-10-04
Date


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